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March 25, 2002

Dr. Sharon Benz
Nutrition and Labeling Team
Center for Veterinary Medicine
Food and Drug Administration
7500 Standish Place, HFV-228
Rockville, MD 20855

Dear Dr. Benz:
It has been brought to my attention that the Food and Drug Administration (FDA) and the Association of American Feed Control Officials (AAFCO) are attempting to mandate the removal of nutritional supplements for sale specifically labeled for animals.

This attempt to control the use and administration of nutritional supplements in companion animals will set veterinary medicine back a generation. We as veterinary practitioners are learning, daily, the benefits of nutritional supplements in the treatment, prevention, and control of diseases other than deficiency diseases. I have successfully incorporated nutritional therapies into my small animal practice for thirty-seven years, and some of the diseases can be attributed to the pet foods under the auspices of AAFCO.

Before you institute the proposed legislation please consider that which follows. In my book "How To Have A Healthier Dog," I discuss the general practices of the pet food industry which includes the indiscriminate use of chemicals, Four D's(Dead, Dying,, Deceased and Disabled animals), Meat and Bone Meal, (the condemned animals of the slaughter houses) which includes pus, urine, fecal matter, hair, Tuberculosis, parasites, the list is almost endless. Chemicals such as BHA, BHT which can initiate birth defects, and damage to liver and kidneys are commonly used preservative. This is but the "Tip of the Iceberg."

That mentioned above, and more, have been approved by AAFCO for pet consumption. During my thirty-seven years of practicing veterinary medicine, I have observed many diseases caused by pet foods approved by AAFCO, the most being allergies including skin, intestines (inflammatory bowel disease), the brain (idiopathic epilepsy), also kidney disease (chronic interstitial nephritis) and pancreatitis. Many of these diseases I have successfully treated with nutritional protocols, which are becoming the standard therapies by veterinary professionals.

During my tenure as a small animal practitioner, I have yet to observe one incident of vitamin toxicity in a treated pet. Scientists are now able to alter those "fat soluble" nutrients that can be toxic to a "water soluble" form which is nontoxic even at high levels of administration.

The FDA and AAFCO are most vital to safeguard the health of our pets but this undertaking to prevent the use of supplements would be a tragedy for companion animals. Since the FDA and AAFCO have not documented the disadvantages of nutritional supplementation and therapies, it is difficult for me to understand their motives. It has been documented that the contents of some pet foods are harmful in that they cause diseases and even death, others can be successfully treated with nutritional therapies. I must admit that I am disappointed that the FDA, a government agency, is aligning itself with AAFCO which is supported by special interest groups. It does not take a "rocket scientist" to determine which industry will benefit most from this action.

I vehemently oppose this action by FDA and AAFCO. More is to be lost than gained by this proposal. I have enclosed a copy of my book, "How To Have A Healthier Dog," with attention to chapter three, "What TV Commercials Don't Tell You About Dog Food."

Respectfully,

Wendell O. Belfield, D.V.M.

The Error of the Millennium in Veterinary Medicine

The background

Diseases of the musculoskeletal system in dogs have been a considerable veterinary problem for decades. Statistics compiled by the canine science associations indicate that 70-75% of the entire canine population are affected. More than half of the dogs of all breeds exhibit pathological changes, especially of the acetabulum and femur, known as hip dysplasia (HD) or canine hip dysplasia (CHD).

The etiological or causal background to canine hip dysplasia has hitherto generally been assumed to be multifactorial heredity. This term originates from farm and slaughter animal breeding and postulates that not only heredity but also environ-mental factors - especially nutrition - play a role in determining characteristics. The relative importance of these factors is expressed as the degree of heritability. For CHD, percentage values of up to 60 % have been assumed or, with reference to 1, of 0.2 to 0.6.

The dog breeding associations in the United States, United Kingdom, France and Germany developed X-ray systems designed to detect and combat hip dysplasia. But only in Germany and several other European countries was it attempted to eliminate CHD through selection, by excluding the dogs exhibiting this condition from breeding in the populations of the different breeds. These genetic measures, however, proved fruitless over a period of three decades. The Verband für das Deutsche Hundewesen (VDH) (German Kennel Club) failed in its attempts to gain approval for this initiative from the American Kennel Club (AKC), The Kennel Club (KC) or the Société Centrale Canine (SCC) in France. The incidence of hip dysplasia still persists at around 60-65 % in all the canine populations of the Western countries. When other pathological changes are included, the total skeletal morbidity rate is as high as 70-75 %. In most cases HD is accompanied by other skeletal diseases.

Veterinarians in the Western countries have traditionally advocated a "balanced diet" - without specifying further details - and have left it to the animal foodstuffs industry to provide dogs with "optimized complete diets". At present, around 80-85% of the total canine population is being fed completely or partially with industrially manufactured preformulated food, which has consequently become accepted as "healthy dog food". These new feeding methods, however, have been unable to significantly improve morbidity in terms of canine hip dysplasia. Indeed, there is also a very high total morbidity level of numerous nutritional diseases affecting various organ systems.

Marc Torel and Klaus Dieter Kammerer - a veterinarian and a scientific journalist with medical training - believe that breeding programs and industrially produced dog food in its present form cannot hope to bring about any fundamental improvements in the

incidence of canine hip dysplasia because CHD is not heritable and because existing dog food does not prevent, but is in fact the original cause of CHD. In these authors' view, canine hip dysplasia is induced solely by malnutrition.

An article in the TU caused a worldwide sensation

In 1996, the respected German journal "Tierärztliche Umschau" (TU) (Veterinary Review) published the continuation article "Topical notes on canine hip dysplasia" by Marc Torel and Klaus Dieter Kammerer, in which these authors traced the entire history of the development of canine hip dysplasia. They claimed that the hereditary nature of CHD had never been conclusively proven and is not supported by any objective evidence, and that breeding programs over three decades were thus inevitably doomed to failure (Tierärztliche Umschau, Volume 51, pp. 455 ff., 1996).

In the opinion of Torel/Kammerer, everything points to the probability that CHD has an alimentary/hormonal etiology and pathogenesis associated with malnutrition and increased production of somatotropin, triiodothyronine (T3), thyroxine (T4), parathormone and insulin-like growth factor IGF-I in the canine organism. The authors went on to draw conclusions regarding the nutrition and keeping of dogs and gave recommendations for the prevention of their skeletal diseases.

The essence of their argument is that CHD is of nutritional and hormonal origin. Malnutrition causes increased production of growth hormone, the thyroid hormones tri-iodothyronine and thyroxine, parathormone and insulin-like growth factor in dogs. The authors give a detailed analysis of the malnutrition and its adverse skeletal effects.

The book aroused great interest among veterinarians and met with a worldwide response. The authors and the editors of TU have received consistently positive feed-back from the USA, the whole of Europe, South Africa and Australia.

The Thirty Years' War and its bitter struggles

These sensational "Topical notes" formed the basis for the Compendium "The Thirty Years' War 1966-1996" published in 1997. The book, described with a certain selfirony by the authors Torel/ Kammerer as a controversial pamphlet, provided further data, facts and back-ground on the subject of canine hip dysplasia, especially in the expanded and revised 2nd edition published in March 1999 (ISBN 3-9807236-1-5).

The title is a deliberate reference to the religious war of 1618-1648 in Central Europe, since the attempts to combat hip dysplasia in the associations and societies, as described by the authors with more than a touch of irony, were not only characterized by the ferocity of a military campaign but, in the face of prevailing dogmatism, were also ultimately futile.

With its "furor teutonicus" - its teutonic fury - the Compendium created an uproar. The authors Torel/Kammerer were not only skilled in verbal cut-and-thrust when deploying their arguments,

but also brought up heavy artillery to support their attack. The hostilities, with their attacks and counter-attacks between the authors and their opponents in industry and veterinary medicine, are a cause of ongoing concern to various official agencies. The Bundestierärztekammer (BTK) (Federal German Veterinary Authority), the VDH (German Kennel Club) and the Waltham/Effem company boycotted the book on the basis of cartel agreements and suppressed reviews and reports in the veterinary literature, the societies and the media.

When these measures failed to prevent the distribution of the Compendium by word of mouth, Waltham/ Effem persuaded the BTK and the VDH to apply to Dortmund District Court to have the book banned. When even a temporary injunction obtained from the biased and prejudicially influenced 7th Civil Division on 23 Sept.1999 failed to halt the sale of the book, the VDH intrigued with the Association of Publishers and Booksellers of the Federal Republic of Germany in Frankfurt and on 10 Feb. 2000 the book title was deleted from the list of available books (VLB list) This meant that "The Thirty Years' War" was effectively placed on the index of prohibited books, since it was no longer available through the book trade, or only with great difficulty. The first legal actions taken against the Association at Frankfurt District Court have so far been unsuccessful due to behind the scenes manipulation among the judges in Dortmund and Frankfurt resulting in agreements preferential to the VDH and its backers. Meanwhile, however, a promise has been extracted that the book will be reinstated and available once more through the book trade.

On the basis of predetermined decisions irreconcilable with the existing legal order and without any statutory basis, and in gross violation of the law of civil procedure, the 7th Civil Division of Dortmund District Court on 16 Mar. 2000 granted the applications of the VDH to have the book banned, thereby effectively curtailing the basic constitutional right of freedom of the press. The proceedings are not yet finalized and the judgement does not yet have the force of law, but is subject to judicial review by the Cartel Division of Duesseldorf Higher Regional Court following an appeal.

On the other hand, Christa Bremer, 3rd President of the VDH, its Secretary Bernhard Meyer and permanent legal adviser Claudia Marienfeldt are now under investigation by Dortmund Public Prosecutors Office on suspicion of making a false statutory declaration and giving false evidence in the course of proceedings. Investigative proceedings are also pending at the same Office into the incorrect and biased presiding judge Becker of the 7th Civil Division and his associate judges Altemeier and Meyer-Tegenthoff due to the suspicion of perverting the course of justice. The presiding judge of Hamm Higher Regional Court is also conducting a disciplinary review into manipulation and suspicion of corruption in Dortmund.

Proceedings are ongoing at the Public Prosecutors Office, Division for Commercial and Medical Crime in Mannheim, against the "trio infernale" of BTK, VDH and Waltham/ Effem due to suspicion of fraud, unfair competition and corruption with active and passive bribery. The computerized breeding value estimation system of Dr.

Beuing at the Institute of Animal Breeding and Domestic Animal Genetics of Gießen University, as a piece of profitable charlatanism, will be among the objects of the Public Prosecutor's inquiries.

The "trio infernale" have no alternative but to defame and attempt to completely discredit the authors Torel/Kammerer, whose charges, if proved correct, would disgrace and compromise in an unprecedented manner the leading figures of canine science, the veterinary profession and animal foodstuffs industry for their blundering and charlatanism continuing over decades. The Compendium "The Thirty Years' War" has become a full-blown political issue.

The Error of the Millennium in Veterinary Medicine

One year later, on 20.09.2000, Klaus Dieter Kammerer published his new book entitled

"The Error of the Millennium in Veterinary Medicine"

subtitled

"Malnutrition-induced Hip Dysplasia as a Non-hereditary Skeletal Disease of Dogs"

(ISBN 3-9807236-0-7)

In his new book K.D. Kammerer traces, with a restrained style of presentation and including much new information, the entire development of canine diet over the past thousand years up to the end of 1999, as well as the nutrition-related skeletal diseases affecting dogs. The other nutrition-induced canine disorders will be the subject of a continuation volume to be published during the course of the year 2000 and entitled

"Nutrition and Malnutrition in Dogs",

in which the bioactive substances and secondary nutrients essential for the long term health of dogs are considered in detail.

The author piles fact upon fact to create an impressive, many colored mosaic that ultimately portrays a dismal scenario:

The 12 theses of Klaus Dieter Kammerer:

1. As in all the Western countries, about 80-85 % of the approximately 5.5 million dogs in the Federal Republic of Germany are suffering from more or less chronic or subchronic obesity, liver parenchymal damage, metabolic diseases, gastrointestinal disorders with pancreatic insufficiency, cardiovascular diseases with vascular sclerosis, impaired immune system with an increased incidence of allergies, infections and carcinomas, as well as a variety of disorders of the musculoskeletal system including dysplasias of all joints, but especially the hip. The life expectancy of dogs is considerably reduced, with cancer now heading the cause of death statistics.

2. Similarly, 80-85 % of dogs are nourished completely or partially

with industrially produced ready-made food which, apart from the quality deficits of the raw materials, generally also suffers from methodological errors in its formulation and manufacturing process. Morbidity due to the aforementioned diseases over the last 30 years has shown an unmistakable correlation with the sales of the animals foodstuffs industry. Especially the skeletal diseases with hip dysplasia are directly related to the decades of malnutrition to which dogs have been subjected and are their immediate consequence.

3. The principle applied in the manufacture of modern dog food was adopted from the mass production of domestic and slaughter animals, especially calf and pig fattening. Calves and piglets are fed a mixture of the primary nutrients

carbohydrates, proteins, fats, minerals and vitamins

calculated to induce rapid growth and weight gain. For retail trade purposes, the 25 and 50 kg bags of calf and pig food were repackaged for dogs into small packs and cans with a water content of up to 80 %. This food differs from slaughter animal feed only by the inclusion of synthetic aromatizers, flavoring agents and attractants specific to dogs, and by the elaborate packaging. One further difference, however, is that to dupe consumers dog food also contains soya designed - sometimes into the very fibre structures - to simulate meat and "meaty lumps". The genetic manipulation of soya results in lipid deposits in the organs and the content of phytoestrogens leads to pathological changes in the skeleton:

"Frankenstein Food"

So not only the alleged heritability of CHD has been adopted from domestic and slaughter animal breeding, but also its nutritional basis.

4. Heating of the raw materials with pressurized steam to as much as 250 °C and the subsequent hot air drying breaks down the carbohydrates, but also denatures the proteins and fats and destroys all the natural vitamins. Also destroyed or altered are the secondary nutrients and bioactive substances vital for long-term animal health. A standardized mineral and vitamin premix is therefore added, but usually in excess. The phytoestrogens remain largely intact, however, and exert the same effects on the body, including bone metabolism, as endogenously produced sex hormones, while the lipid deposits lead to sclerosis of the blood vessels and thus to hypertension, cardiac and circulatory diseases. These feeding methods in dogs lead especially to hyperalimentation, fibrous osteodystrophy, osteochondrosis (OCD), hormonal dysfunctions as well as vitamin A and D3 hypervitaminosis with their associated pathological skeletal changes including hip dysplasia. Vitamin D3 overdosage alone, both in food and vitaminized mineral preparations, can induce Legg-Calvé-Perthes disease with aseptic necrosis of the femoral head with mushroom-shaped and cylindrical protrusions and consequently CHD. Most ready-made food usually has added appetizers that usually stimulate consumption, resulting in more or

less marked obesity and, in the long term, to chronic diseases of various organ systems, especially of the cardiovascular type. Modern domestic animal food designed in the laboratory became causally responsible for hip dysplasia in dogs. Whereas calves and pigs, after reaching a certain size and weight within a few months, are slaughtered together with their pathologically altered skeleton, dogs have to propel themselves around on their ruined bones for the rest of their lives.

5. The heritability of hip dysplasia and the other skeletal diseases of dogs has never been demonstrated. The first veterinarians to investigate the etiology of CHD elaborated a number of hypotheses of which multifactorial inheritance was finally chosen as the winning candidate, since it appeared to explain everything. Subsequent investigators adopted these assumptions unreflectingly and uncritically and merely perpetuated the error. Others wrote papers designed to please their sponsors, for remuneration. There is a certain ironic pleasure to be had from the fact that Professor Helmut Meyer, as a nutritional scientist, Senior Assistant and prospective Director of the Institute of Animal Nutrition of Hanover Veterinary College published a paper on the heritability of CHD in 1968, although this was not his specialization and he had no understanding of canine genetics, but was already maintaining very close and financially rewarding business links with Waltham/Effem. Finally, a downright dogma was established regarding the multifactorial (polygenic) heritability of hip dysplasia.

6. It is perhaps one of the ironies of fate that CHD is indeed a multifactorial disease, with a variety of nutrition-induced underlying disorders as possible causative factors:

a) Rickets (softening of bone due to Ca and vitamin D3 deficiency)
b) Moeller-Barlow disease (scurvy due to vitamin C deficiency)
c) Vitamin A+D3 hypervitaminoses (toxic overdosage)
d) Legg-Calvé-Perthes disease (femoral head necrosis)
e) Genu valgum (knock-knees)
f) Hormonal dysfunctions (thyroid disorder etc.)
g) Osteochondrotic syndrom (degenerative cartilage disease)
h) Fibrous osteodystrophy (bone dystrophy)
i) Obesity (overweight)
j) Overload during movement

The metabolic derangements with alimentary/hormonal dysfunctions underlying these pathologic conditions thus lead to dysplasias of the entire skeleton and range from very mild and often clinically undiagnosed disease courses to severe deformations. Since the dynamic and static forces involved in movement are most pronounced at the hip joint, this is where the first deformations (dysplasias) inevitably develop. Dysplasias can also occur in all other joints, however, and they would be observed in more or less severe form in all dogs with CHD if X-ray examination were not confined to the hip joints. Many cases of canine hip dysplasia are also accompanied by dysplasia of the shoulder, elbow and knee joints.

7. The etiology and pathogenesis of hip dysplasia can thus only be explained in terms of multifactoriality, but omitting the genetic factor. Accordingly, hip dysplasia is to be regarded as a complication of metabolic disease in puppies and young dogs, and as a symptom of a generalized, alimentary/hormonal skeletal disease, and on no account as a hereditary, isolated anomaly of acetabulum and femur.

8. The multinational corporations Nestlé (Alpo, Fancy Feast, Friskies, Migthy Dog), Colgate-Palmolive (Hill's Science Diet), Procter & Gamble (Iams, Eukanuba), Heinz (Amore, Gravy train, Recipe, Verts) and especially Mars with its affiliates Waltham and Effem (Advance, Cesar, Chappy, Formula, Frolic, Kal Kan, Mealtime, Pedigree) control the multi-billion-dollar world market for industrially produced dog and cat food, including 90% of the European market. Ralston Purina (Pro Plan, Purina) and Royal Canin (Selection, Size mini-medium-maxi) also enjoy a certain prominence. Effem is the market leader in Germany with a 75-80 % share of a market worth 3,500 million German Marks and, with a turnover of about 2,000 million German Marks makes a profit of almost 1,000 million. These big corporations are behind most of the many small producers.

9. These business empires have virtually unlimited funds for advertising. In the Western countries, they have advertising budgets totaling more than 10,000 million DM to splash out on dog food advertising. In the Federal Republic of Germany alone, Mars together with Waltham and Effem invest almost 500 million DM annually in the public and non-public domains. The money is devoted firstly to poster and press advertising, TV spots and for paid public relations articles in newspapers and magazines. The canine popular press is completely under the control of the animal foodstuffs industry and is only allowed to publish articles favorable to its backers' interests. Canine science societies and associations and their functionaries enjoy considerable financial benefits. The VDH (German Kennel Club) and its board members are annual beneficiaries to the tune of several millions and as such are to be regarded as completely dependent and corrupt. While all this money is paid to buy people and votes, hush money is paid to the parties, institutions and the judiciary.

10. The veterinary profession too is now firmly in thrall to these multinational corporations. Many veterinarians owe their living to this mutual sleaze and corruption. Of the 20,000 practicing veterinarians in the Federal Republic of Germany, about 20-25 % are unemployed anyway and another 20-25 % would have to shut up shop if they didn't receive the average DM 40,000 - 50,000 annually from the sale of special diet feeds and the X-ray system of the VDH (German Kennel Club) they need to cover their practice costs (rent, staff). Considerable benefits in cash and kind find their way to students of veterinary medicine, medical-technical assistant personnel and the veterinarians themselves. The opinion-leading veterinarians and nutritional scientists at the institutes ofanimal nutrition are almost without exception bribed and travel around the world at the expense of the various companies. They therefore recommend these products from sheer self-interest and regale dog owners with the benefits of industrial dog food while keeping quiet about the disadvantages. Since the entire advertising budgets are

funded from the turnover and hence from the sales prices of the various brands, consumers and dog owners are actually paying out of their own pockets for the brainwashing to which they are continually subjected, not even realizing that these by no means so optimized products are also grossly overpriced. The same or similar conditions prevail in the other countries.

11. The companies mentioned above - but especially Waltham/Effem - initiated the dogma of the heritability of skeletal diseases of dogs to conceal the methodological errors being perpetrated in industrial animal foodstuffs production and have sustained their campaign over three decades. Almost all the authoritative veterinarians in the USA, UK and Germany who are or have been involved in studying CHD have at some time received inducements from Waltham/ Effem, Ralston Purina or the others. The financial calculations and marketing strategies require not healthy, but sick dogs. The diseases of the various organ systems induced by malnutrition gave the impetus for market innovation in the form of the numerous dietary products sold through veterinarians, to whom the industry not only delivers the various brands free of charge, but also the sick dogs necessary for their consumption. In this thoroughly corrupt system, the industry and veterinary profession in the Western countries are actively engaged in white collar and white coat crime and are perpetrating the biggest fraud in the history of veterinary medicine, nothing less than a chronique scandaleuse.

12. The malnutrition of dogs and the dogma of the heritability of its hip dysplasia are firstly a double error and considering the disaster for dogs' health created and sustained over four decades by the industry and the professors in their service at the faculties of veterinary medicine, especially in the USA, UK and Germany, can only be described as the error of the millennium in veterinary medicine: millions of dogs around the world have been fed to a state of illness or to death during this period. By reforming canine nutrition, improving the quality and eliminating the methodological errors in production, morbidity due to the numerous nutrition-induced diseases of dogs could be significantly lowered. In particular, the skeletal diseases associated with hip dysplasia could be at least considerably reduced.

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Version of 20.09.2000

Open Letter by Matthias Rath, M.D. to the Health Food Community in the USA

Dr. Rath is the physician and scientist who led the medical breakthrough on vitamins and cardiovascular disease documented in his book "Why Animals Don't Get Heart Attacks - But People Do". Two-time Nobel Laureate Linus Pauling stated in his last will in June 1994, *"There is no question in my mind that I thought about Dr. Rath as my successor".*

Dr. Rath was born in Germany and worked in the USA for many years. Now he lives in Holland and is organizing the battle against the head of the international Pharma-Cartel Germany's Hoechst, Bayer, and BASF and their efforts to ban vitamins and other natural therapies world-wide.

With this Open Letter Dr. Rath informs the health food community in the U.S. and the American people about important recent developments in the global battle to preserve vitamin freedom. Moreover, this letter is an appeal to every human being to seize the historic responsibility and opportunity helping to end the tyranny of the Pharma-Cartel and lay the foundation of a new health care in the interest of the people. The time to act is now.

German Pharma-Cartel Hoechst, Bayer and BASF – Unmasked as the Organizers of Auschwitz – Now Threaten World-Wide Vitamin Freedom

- **German pharmaceutical multinationals Hoechst, Bayer and BASF spearhead international efforts to ban health information on vitamins and other natural therapies**
- **Deutsche Bank (German Bank), in a futile forward defense, admits that they financed the concentration camp Auschwitz and Nazi war efforts on behalf of Hoechst, Bayer and BASF**
- **With credibility of the Pharma-Cartel at an all-time low, people around the world now have the historic opportunity to liberate themselves from the yoke of the Pharma-Cartel and its "business with disease"**
- **Health food stores and the health food community become cornerstones of a new community-based health care system that is effective, safe and affordable**

The years 1999 and 2000, the turn of the millennium, also coincide with a fundamental turn in human history and human health. The 20th century will become known as an epoch were human health was controlled by the pharmaceutical industry, an industry that shamelessly promoted diseases as the basis for a trillion-dollar annual business with pharmaceutical drugs.

Now, at the end of this century of deadlock for human health, the most common diseases are recognized to be the direct result of vitamin deficiencies and therefore preventable in a natural way. As a direct result of this knowledge heart attacks, strokes, high blood pressure, heart failure affecting and killing millions of people today will become largely unknown during the 21st century.

In order to secure the survival of its trillion dollar global market, the pharmaceutical industry will put up a fierce fight against anything that threatens it. The key for the survival of the pharmaceutical industry, as we know it today, is the immediate and comprehensive ban of information about natural therapies, particularly health information about vitamins.

The health food stores and the natural health community at large is facing another wave of attacks from new regulations, legislation to the infiltration of the nutritional supplement industry and the take-over of vitamin companies by pharmaceutical multinationals.

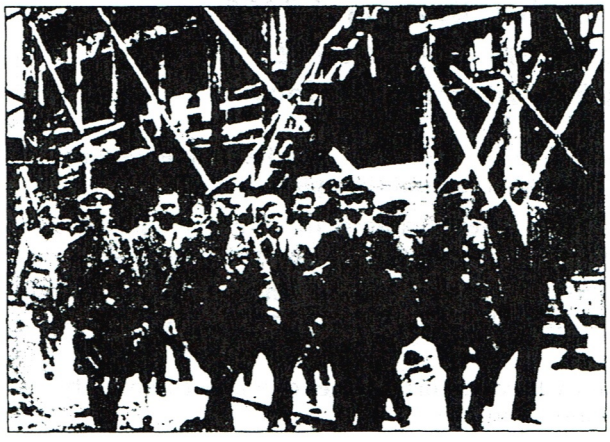
In the battle for global health care in the next millennium there will be only one victor. On one

side is the pharmaceutical industry which maintains and promotes disease as the very basis of expanding their pharmaceutical markets. On the other side is the natural health community with its goal to prevent and eliminate diseases through vitamins and other natural therapies.

In this historic battle, the Pharma-Cartel has received a series of severe blows before, among them the DHEA act of 1994. But now, in February 1999, the Pharma-Cartel received its biggest blow from which it is unlikely to recover.

Under pressure, Deutsche Bank (German bank) had to reveal that the German pharmaceutical companies Hoechst, Bayer and BASF, the spearheads of the international Pharma-Cartel, were the organizers of the worst crimes ever committed in recorded human history.

Chemical/pharmaceutical giants Hoechst, Bayer and BASF were the organizers of the Auschwitz concentration camp, the financiers of Hitler's rise to power, and the driving force of his military conquest of the world, the Second World War.



On March 1, 1941, managers of Hoechst, Bayer and BASF (IG Farben) inspect the construction site of Auschwitz concentration camp with Hitler's Deputy, SS Chief Heinrich Himmler.

These revelations show the true face of the international Pharma-Cartel. In its insatiable greed to control the chemical and pharmaceutical markets of the world, this industry risked the death of over 50 million people during World War II. Now, with its plan to ban health information on vitamins, the same Pharma-Cartel risks death of more than 600 million people from preventable disease in the next generation alone.

Pharmaceutical Industry – Business Based on Proliferating Diseases

- According to European health insurance companies, 98% of the pharmaceutical drugs currently marketed and prescribed are without proven efficacy. Thus it is now established that most pharmaceutical drugs can neither prevent diseases nor cure them.
- According to the *Journal of the American Medical Association,* severe and known side effects of pharmaceutical drugs are the fourth leading cause of death in the US and other industrialized countries. Thus, in an effort to expand their global markets, the pharmaceutical industry created the fourth largest epidemic to haunt mankind, the *drug side effect epidemic.* (JAMA, April 15, 1998).
- In a public alert, the *Journal of the American Medical Association* (JAMA) in its January 6, 1996 issue warned that all cholesterol-lowering drugs currently on the market cause cancer and should be avoided. Yet the Pharma-Cartel consistently ignores this warning. Since this public warning, the market for cholesterol-lowering drugs has been extended to an estimated 20 million people worldwide creating a time bomb for a future cancer epidemic.
- After publication of these anti-Pharma-Cartel studies in JAMA, the pressure of the Cartel on the American Medical Association (AMA) increased. In January 1999 in an unprecedented move the AMA fired JAMA-Editor-in-Chief Charles Lundberg under a bogus pretence. The real background of this step is the Pharma-Cartel's effort to control and manipulate the information provided to the doctors in America and beyond.

The credibility of the pharmaceutical industry with patients and consumers is approaching zero. In a desperate effort, the Pharma-Cartel is putting the finger in this dam of lost credibility.

1999/2000 Decisive Years in Battle of Human Health Against the Pharma Cartel

The next two years will be decisive in the global battle for a new health care. The Pharma-Cartel remains determined to outlaw health information on vitamins and other natural therapies worldwide.

- Spearheaded by Germany's Hoechst, Bayer, and BASF, the world's largest exporters of pharmaceutical products, as well as the German government, the next meeting of the UN *Codex Alimentarius* Commission on nutrition and dietary supplements is scheduled for spring 2000 in Berlin, Germany.
- With global mergers, the pharmaceutical industry tries to prepare for the decisive battle to manipulate world opinion about health matters with mass media advertising through sheer financial force.

- Lobbying and manipulation of national and international pharmaceutical laws remain a key tool in the Pharma-Cartel's effort to suppress natural health information. In a spectacular move, German pharmaceutical giant Hoechst plans to merge with French Rhone Poulenc and establish its headquarters at Strasbourg, the seat of the future government of the United States of Europe.

- At the national level every legal device is used by the Pharma-Cartel to roll back earlier defeats. New nutritional labeling legislation is introduced by the Federal Trade Commission (FTC) violating the accomplishments of the Dietary Health and Education Act of 1994.

- New "standardization" rules and requirements for clinical studies are introduced making it difficult or impossible for vitamin companies to finance proving the efficacy of natural health remedies.

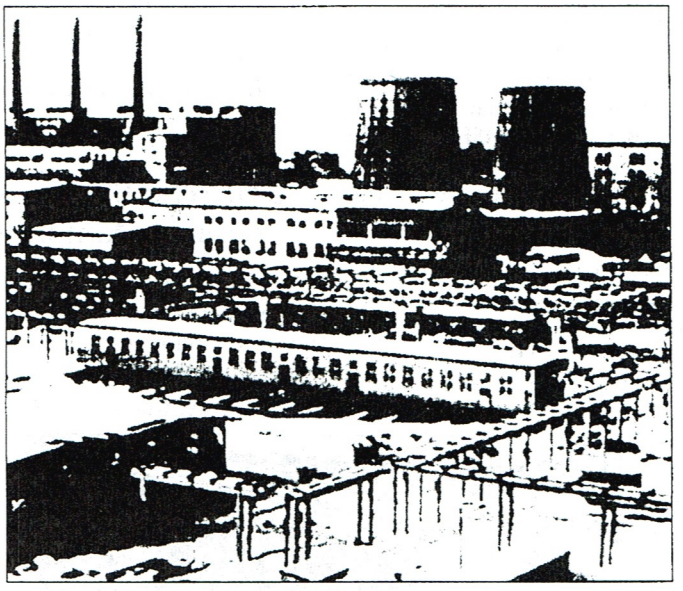
- As a last desperate step, pharmaceutical multinationals are trying to infiltrate the health food industry and its industry bodies. In the April 1996 edition of the *Medical Investment Report*, Rexall Sundown, an influential member of the NNFA and of the Council for Responsible Nutrition (CRN) announced a "strategic alliance" with Hoechst. Shortly thereafter, Rexall Sundown tried to acquire other major vitamin companies in the US. Not surprisingly, at the last meeting of *Codex Alimentarius* in September 1998, CRN was openly siding with the Pharma-Cartel's position. Almost a side aspect in this context: Rexall Sundown was publicly connected to Organized Crime in a lead article of the April 14, 1997, issue of the *Dow Jones Weekly Barron's*.

All these efforts are not signs of strength, but of a battle that can not be won by the pharmaceutical industry. But the biggest blow for the Pharma-Cartel was yet to come.

Hoechst, Bayer and BASF – Committing Crimes Against Humanity Then and Now

In a widely publicized speech at the city hall of Chemnitz, Germany on June 21, 1997, I had already revealed the dark Nazi past of Hoechst, Bayer and BASF in the context of our fight against the *Codex Alimentarius* plans. This tribunal against the Pharma-Cartel was immediately translated into several languages and disseminated through the Internet (www.drrath.com). Over the last 18 months this **Chemnitz Program** had created a public ground swell inside and outside of Germany.

It was this speech and its international repercussions that terminated 55 years of silence on the part of German companies ignoring the justified demands of victims from Auschwitz and other forced labor camps.



The true nature of the concentration camp Auschwitz was that of a forced labor site for IG Auschwitz, the largest industrial plant in W.W.II Europe and a subsidiary of Hoechst, Bayer and BASF's IG Farben.

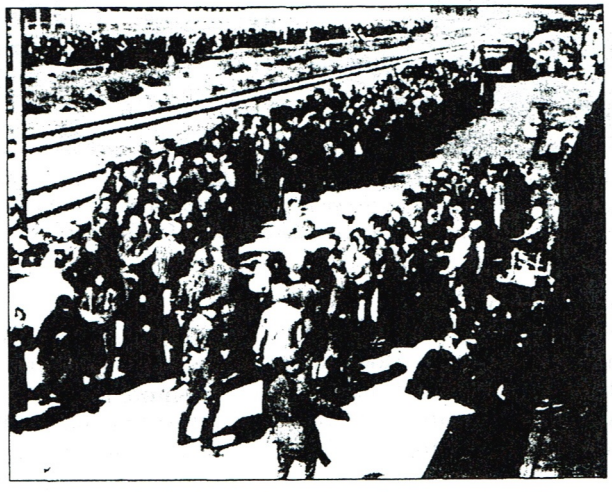
On February 4, 1999, 20 months later and under increasing international pressure, the largest German bank, Deutsche Bank, had to open its **Nazi files** totaling more than 6 miles in length. The Deutsche Bank files about the Nazi connection of Hoechst, Bayer and BASF force us to rewrite the history of W.W.II and the 20th century. The revealed documents show:

- To achieve control of the world's natural resources and raw materials **Hoechst, Bayer and BASF's promoted Hitler's rise to power and his W.W.II effort** to conquer the world. With over 70 million Reichsmark (more than half a billion dollars in today's currency) they were the single largest donors to the Nazi Party, essentially financing the preparations for W.W.II. To combine their strategic global efforts Hoechst, Bayer and BASF had formed a Cartel with the code name "IG Farben" (Interest Union Colors).

- Hoechst, Bayer, BASF's **IG Farben executives Hermann Schmitz and Karl Krauch** developed the four-year economic plan for the war preparation and met with Hitler's Reichs-Marschall

Hermann Göring on June 15, 1936. Three months later, on September 9, 1936, Hitler himself presented the IG Farben plan in a spectacular announcement as the "New Phase," the official Nazi economic policy to prepare for war.

- 80% of the positions in the newly created German **Ministry of "Resources and Raw Materials"** in W.W.II Germany were filled with Hoechst, Bayer and BASF specialists who coordinated the acquisition of industries and property in conquered European countries on behalf of IG Farben.
- The Auschwitz concentration camp was the forced labor outpost of "IG Auschwitz," the largest industrial plant in W.W.II Europe and a 100% subsidiary of Hoechst, Bayer and BASF's IG Farben. This concentration camp supplied free labor for nearby "**IG Auschwitz**" which produced 100% of all synthetic gasoline and rubber as well as other chemicals for Hitler's war. The chemical and pharmaceutical corporations Hoechst, Bayer and BASF were the organizers, architects and the operators of the Auschwitz concentration camp, the site of the worst crimes ever committed against humanity.
- To test unexplored pharmaceuticals and vaccines, Hoechst, Bayer and BASF used thousands of innocent inmates of the concentration camp as **human guinea pigs.** More than 50% of all participants died during these "experiments." Many more were silenced afterwards so that they would not be able to tell others about their torture.
- Daily selections among the work force of Hoechst, Bayer and BASF were made at the factory gate to optimize work efficiency of "IG Auschwitz." "Useless work force" was disposed of in the gas chambers of the Auschwitz camp. Even the extermination chemical **Zyklon B** was provided by Hoechst, Bayer and BASF's IG Farben.



Thousands of prisoners from all over Europe arriving at the Auschwitz ramp were selected for forced labor or immediate death.

- In the 1947 **Nuremberg War Crime Tribunal** several managers of Hoechst, Bayer and BASF were convicted of mass murder, slavery and other crimes against humanity. **Telford Taylor**, the lead US-Prosecutor at the Nuremberg Tribunal concluded: **"Without the support of IG Farben the Second World War would not have been possible."**
- In 1947 the Nuremberg War Tribunal **dismantled the IG Farben-Cartel,** but Hoechst, Bayer and BASF were allowed to continue. By 1953 all of the convicted managers were free and immediately assumed highest positions in post-war German industry.
- Only ten years later, in 1963, Hoechst, Bayer and BASF were ready for their next global attack on human rights. As part of the global expansion of their pharmaceutical market, Hoechst, Bayer and BASF had to make sure that the health benefits of vitamins remain unknown. Towards this end they pressed the German government to spearhead an international effort to ban vitamins and other non-patentable natural therapies. In 1963 the German government became the political executor of these plans by initiating the now infamous UN ***Codex Alimentarius*** commission on nutrition, and chairing this commission since.

Deutsche Bank – Assisting in Crimes Against Humanity Then and Now

Why was Deutsche Bank's CEO Rolf Breuer forced to make these revelations and why did Deutsche Bank have to come out with the truth now, over half a century after the end of W.W.II?

- On February 6, 1999 the influential German Newspaper Frankfurter Allgemeine Zeitung (FAZ) wrote about the Nazi-IG Farben documentation: "**Deutsche Bank was the house bank of IG Farben** and they (Hoechst, Bayer and BASF) dictated the business terms of this bank."
- Half a century ago Hoechst, Bayer and BASF dictated that Deutsche Bank finance Hitler's ***military* conquest of the World** on behalf of these chemical/pharmaceutical multinationals. Their involvement was so deep that a 1946 Allied investigation of the Deutsche Bank recommended it be liquidated and its leaders tried as war criminals.
- Today Deutsche Bank is still the "house bank" of the Pharma-Cartel and this bank plays the same role: Financing the way for the ***economic* conquest of the world** on behalf of the German Pharma-Cartel.

- This global strategy explains the current plan of Deutsche Bank to acquire **Banker's Trust of America** to become the largest bank in the world. In light of the facts, neither the people of America

Pharma-Cartel CEOs Dormann (Hoechst), Strube (BASF) and Schneider (Bayer). The current management of these corporations is hand selected and shaped by the previous Chairmen of these corporations. Winnacker (Chairman Hoechst), Wurster (Chairman BASF) and Hansen (Chairman Bayer) were all members of the Nazi party during W.W.II. and held the highest corporate positions of these pharmaceutical companies until the early 1980s.

nor American corporations will benefit from this merger. To the contrary. People, politicians and anti-trust authorities in the USA should stop this merger now.

- The Pharma-Cartel sent Deutsche Bank boss Breuer into the minefield in an effort to clean up the Nazi past on their behalf. In a desperate forward defense they thought by revealing the historic facts they might be pardoned by the world opinion. This pardon, they know, is a precondition for the unhindered expansion of their global pharmaceutical market.
- Even with the timing for going public with this historic confession, Deutsche Bank and the Pharma-Cartel showed how much they fear the light of the day. The revelations were deliberately placed during times of maximum media distraction in the US the last days of the Clinton impeachment trial and in Germany at the climax of carnival season.

Futile Efforts by the German Government to Protect the Pharma-Cartel's Interests

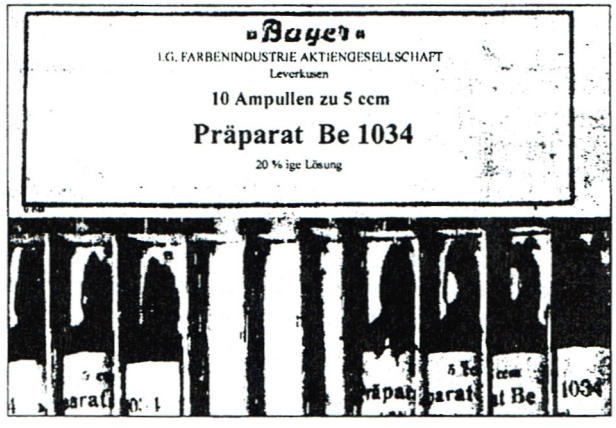
The current German government continues the tradition and functions as a blind servant of the German Pharma-Cartel. Immediately after he had become German Chancellor in September 1998, **Gerhard Schroeder** started a whole series of secret meetings at the Chancellery with executives from Hoechst, Bayer, BASF and other German companies. The purpose of these meetings was to find a way to protect German companies from an avalanche of class action lawsuits from concentration camp survivors.

Schroeder assigned his chief of staff **Bodo Hombach** to the job of manipulating public opinion and twisting the arms of the Jewish community as well as the US-government officials. Hombach's travel party includes Rolf Breuer, the CEO of the German Bank who was sent on this sinner's pilgrimage by his corporate clients.

The targets of the Hombach-Breuer mission in the US are, among others:

- **The World Jewish Council** from whom they want approval,
- **Ed Fagan** and other attorneys from class action lawsuits who are pressed to abandon those lawsuits,
- The US financial and anti-trust authorities, among them New York City Comptroller **Alan Hevesi**, who are pressed to approve the merger between Deutsche Bank and Banker's Trust,
- **Stuart Eizenstat**, Under Secretary for Economic, Business and Cultural affairs at the US-State Department, who is pressed to legally exclude any further lawsuits from Nazi victims.

Hombach's mission is to try to pressure the US government for a legal guarantee that German corporations would not be held responsible any longer for



Medical experiments (here typhoid vaccines from Bayer corporation) were conducted with Auschwitz concentration camp inmates. More than half the innocent participants died cruelly during these experiments.

the crimes they committed. In return, on February 16, Schroeder and Hombach announced a "fund" for Nazi victims, which would leave some victims with a few hundred dollars each, while ignoring most of them.

The proposed deal would mean that in return for starting the Second World War, plundering all of Europe, killing millions of people and using millions more as slaves, the German Pharma-Cartel would be

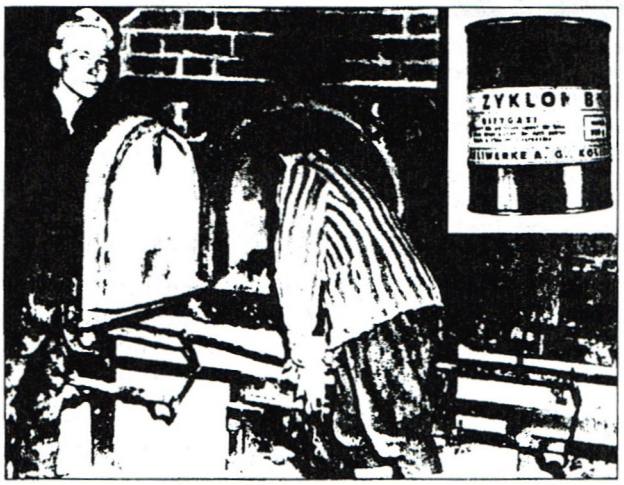
pardoned in return for a donation of a few million dollars and given green light to continue plundering millions of people worldwide by means of a trillion-dollar pharmaceutical market.

On Thursday, February 11, Germany's Chancellor Schoeder even had the audacity to meet with President Clinton pressing him to back this remarkable plan. He was not successful.

Lessons to Be Learned for History

There can be **no amnesty for Hoechst, Bayer, BASF**, the builders of Auschwitz, as long as these corporations continue to commit crimes against humanity.

In the interest of excessive financial gains, these corporations continue to cause unnecessary suffering and premature death of millions of people by maintaining and proliferating diseases in epidemic proportions in order to expand a global pharmaceutical market of over one trillion dollars.



IG Auschwitz workers, exhausted from forced labor, were disposed of in the Auschwitz gas chambers. IG Farben even manufactured and provided Zyklon B, the chemical substance that was used to kill them together with 5 million other innocent victims.

With their plan to ban life-saving health in-formation on vitamins and other natural therapies, they actively prevent the eradication of heart attacks, strokes and other common diseases, the primary cause of which are vitamin deficiencies.

Hoechst, Bayer, BASF and other members of the international Pharma-Cartel have to be held responsible not only by the survivors of the Auschwitz concentration camp, but by millions of patients worldwide who have fallen sick, remained sick or by the relatives of patients who died as the result of known severe side effects of pharmaceutical drugs.

Why We Can Win the Battle Against the Pharma-Cartel

The main reason why we can and will win this battle for a new health care system is that truth is on our side. The Pharma-Cartel can only win if it is able to suppress the truth. **We can win if we speak out loudly about the truth.** This is true for the historic facts as well as for the current facts presented in this letter. Let's have a look at the recent years:

- In 1991 I discovered that heart attacks and strokes are no diseases but, similar to scurvy, the result of vitamin deficiencies and therefore preventable. These discoveries are summarized in my book "Why Animals Don't Get Heart Attacks – But People Do."

- For the pharmaceutical companies it was clear at that time that the survival of their hundred billion dollar annual market of cardiovascular pharmaceuticals had become dependent on one single factor: how effectively could they prevent the information about this medical breakthrough from spreading.

- It was this medical breakthrough that triggered the fierce attack on nutritional supplements led by the FDA on behalf of the Pharma-Cartel. But they could not win this battle. The people of America won the battle for vitamin freedom culminating in the Dietary Supplement Health and Education Act (DHEA).

- Analysts confirmed that the DHEA of 1994 was the worst defeat in the history of both the FDA and the Pharmaceutical industry. Once again, the moral strength that comes with the truth has prevailed over financial and political power.

- With the US the largest national market was lost for the Pharma-Cartel, forcing it to turn to the international level. This is the background why the dormant UN *Codex Alimentarius* Commission was suddenly reactivated in 1995, bringing the center of the global battle for vitamin freedom to Germany.

- In 1996 my book was published in German and in 1997 I moved to Europe to lead the battle against the head of the Pharma-Cartel-hydra directly from its doorstep. We were able to achieve some remarkable accomplishments:

- At the *Codex Alimentarius* meeting in Berlin, September 21-25, 1998, the Pharma-Cartel was unable to get consensus from the delegates of more than 40 countries. The plan to outlaw natural health information globally had to be postponed to the next meeting in spring 2000. The resistance we had put up before and during the Codex meeting in Berlin, including the **Berlin**

Tribunal against the Pharma-Cartel, is documented on our Website.

- In the Federal German elections the previous chancellor Helmut Kohl was voted out of office by a landslide defeat. Helmut Kohl was a former lobbyist for the Pharma-Cartel and had been promoted by the Cartel into the highest position of the German government. From there he served the Pharma-Cartel politically for 16 years on the national and international level.
- Analysts confirmed that our national cam-paign for vitamin freedom in Germany became the single most important factor in the land slide defeat that washed away not only Helmut Kohl but also the entire previous government.
- On behalf of patients world-wide and to clear up the role of Helmut Kohl as political accomplice for the criminal practices of the Pharma-Cartel I filed **a complaint against Kohl for** assisting in crimes against humanity and other felonies with the Federal prosecutor in Bonn. The text of the complaint can be reviewed on our Website and could serve as a starting point for class action lawsuits against the Pharma-Cartel in many countries.

What are the next steps?

Responsibility of Health Food Stores

During the battle for vitamin freedom in the US from 1992 to 1994, the role of the health food stores can not be overestimated. Thousands of health food stores across America became the locations were information was disseminated to millions of customers, and they were the coordination points of fighting back the attack of the Pharma-Cartel.

In this battle the health food community gained invaluable experience for the next and decisive stage of the battle. There can be no doubt that the Pharma-Cartel wants to eliminate the natural health sector or confine it to a fringe existence. But the actual role of the health food store is exactly opposite:

Health food stores across America have become the corner stones of a new community-based health care system. By joining the public fight against the Pharma-Cartel at this new and decisive stage, the health food stores of America and beyond will emerge as the natural leaders into a new era of human health. This new health care system will have rid itself from the yoke of the Pharma-Cartel and will promote the prevention, natural healing and, above all, the eradication of diseases.

What Needs to Be Done Now

There simply can not be amnesty for the organizers of Auschwitz as long as they continue to risk the lives of millions of people worldwide.

The first and foremost task is to inform your customers about these developments and the background. You may copy this **Open Letter** and hand it to your customers. Your store should become a continuous information center that can serve your customers with information they do not receive anywhere else.

Your customers may also want to take a firm stand on this important issue. Here are some actions that need to be taken up immediately. Make sure your Senator, Congressman and the White House learn about your opinion:

- No legislation can be allowed protecting the organizers of Auschwitz from further lawsuits from their victims
- All talks with German politicians acting on behalf of the Organizers of Auschwitz need to be stopped immediately
- There can be **no approval of the merger** between Deutsche Bank and Bankers Trust designed to pave the way to expand the grip of the German Pharma-Cartel on the American people and businesses. Let your opinion be known.
- **German Chancellor Schroeder, Chief of Staff Hombach and other accomplices of the Pharma-Cartel must be declared undesired persons** in America as long as they act as accomplices of the Pharma-Cartel and support *Codex Alimentarius*. Send them an E-mail at the address below.
- **Hoechst, Bayer, and BASF**, the organizers of Auschwitz and the spearheads of the international Pharma-Cartel and of *Codex Alimentarius* must be **banned from trading on any US stock exchange.** Speak with your political representative, help to make the issue public.
- Consumers in the US and around the **world must boycott** all products from Hoechst, Bayer, and BASF until these companies have paid due compensation for the past crimes against slave labor victims as well as the other destruction and suffering their action caused across Europe. Inform your friends, neighbors and colleagues about this boycott. Ask local newspapers to write about it.
- **Individual and class action lawsuits** must be filed **against Hoechst, Bayer, and BASF** and other pharmaceutical companies by patients who suffered from severe side effects of drugs marketed by those companies.

- **Pharmaceutical companies must open their files** on the side effects of pharmaceutical drugs they are selling in order to protect patients from being harmed.
- **Write to your political representatives** urging them to stop any and all support for the Pharma-Cartel's plan to restrict health information in relation to vitamins and other natural therapies at the national or international level.
- Write to your political representatives urging them to **stop all legislative and regulatory plans undermining the accomplishments of the Dietary Supplement Health and Education Act.**
- **Write to the Commissioner of the FDA, the FTC** and inform them that any regulation they issue that complicates the free exchange of life saving information on natural health, is compromising human health and human lives. Any official involved in such measures should be tried for criminal offenses.
- When you deal next time with CRN or any other organizations pretending to represent your interest, have a close look.

I encourage you to join this new stage of fighting the Pharma-Cartel in your own interest for the survival of your health food store, in the interest of your customers and of millions of Americans who are interested in effective, safe and affordable natural health.

Sincerely yours,

Matthias Rath, M.D.

Important E-mail adresses:

USA:

- **Alan Hevesi,** Comptroller of New York City
  support@financenet.gov
- **Bankers Trust Alex Brown**
  webmaster@Alexbrown.com
- **Stuart Eizenstat,** Under Secretary for Economic, Business, and Agricultural Affairs, US-State Department
  publicaffairs@panet.us-state.gov
  secretary@state.gov
  state.business@erols.com
- **President Clinton**
  www.whitehouse.gov/WH/Mail/html/Mail_President.html
- **Vice-President Gore**
  www.whitehouse.gov/WH/Mail/html/Mail_Vice_President.html
- **Simon Wiesenthal Center** L.A.
  www.webmaster@wiesenthal.com
  http://motlc.wiesenthal.com/pages/mailform.html
- **US Embassy Germany**
  http://www.usembassy.de/e0.htm
- **Edward Fagan,** Attorney for Auschwitz victims, New York, NY
  Fax: 212 839-7127

Germany:

- **Gerhard Schroeder,** Chancellor,Bonn
  http://www.bundeskanzler.de/01/kanzlerf.html
- **Bodo Hombach,**Secretary of the Chancellery, Bonn
  www.bundeskanzler.de/02/amtf.html
- **Germany's Central Council of Jews**
  Zentralrat der Juden in Deutschland, Rungsdorferstraße 6, D-53173 Bonn
  Fax. +49 (0) 228 35 54 69
- **Hoechst**
  EMueller@corpcomm.hoechst.com
  PElliott@corpcomm.hoechst.com
  PPohl@corpcomm.hoechst.com
  CTilger@corpcomm.hoechst.com
- **BASF**
  http://www.basf.de/basf/html/e/mail/email.htm
- **Bayer**
  http://194.231.159.80/Maildesk.nsf/ResponseEOther?OpenForm
- **Deutsche Bank**
  http://public.deutsche-bank.de/global/index.htm
  http://public.deutsche-bank.de/global/navigation_email.nf/Frameset/KCFR-43AEM2?OpenDocument
- **Dresdner Bank**
  investor.relations@dresdner-bank.com

Other countries:

- **Government of Israel (Knesset)**
  feedback@www.knesset.gov.il
  http://www.knesset.gov.il/knesset/engframe.htm
- **World Jewish Congress**
  wjc@virtual.co.il
- **World Health Organization**
  http://www.who.int

For further information about the work of Dr. Rath you can contact the following websites:
www.drrath.com or ***www.rath.nl***

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HOSPITALS AND CLINICS
AIDS Clinical Research Center

SAN FRANCISCO, CALIFORNIA 94143

November 24, 1984

Dr. Wendell O. Belfield
Belmar Veterinary Hospital
3091 Monterey Rd.
San Jose, CA 95111

Dear Dr. Belfield:

I read with interest your article, An Orthomolecular Approach to Feline Leukemia Prevention and Control, which appeared in the Journal of the International Academy of Preventative Medicine (JIAPM, 1983, 40-44).

In that article, you observe that three cats treated with 500mg of ascorbate became antibody negative for feline leukemia virus 6 months after initiation of therapy, whilst their three littermates, not fed this dietary supplement, remain antibody positive. I know that you recognize the need to subject this observation to a double-blind crossover study to validate the hypothesis that ascorbate was responsible for this change in antibody titer. Simultaneously, one could attempt to recover feline leukemia virus from infected cats to see if ascorbate administration is associated with variants in viral antigen titer. I am in hopes that you have already initiated this study, or that your article has stimulated the necessary scientific investigation.

I write to inquire what additional data you have obtained since your article last year, and to ask for the names and addresses of individuals who have tested your hypothesis.

Sincerely,

Marcus A. Conant, M.D.
Director, AIDS Clinical Research Center

MAC/ds
cc: Mr. Stew Anderson, 444 Oak St., SF CA 94102

An Orthomolecular Approach To Feline Leukemia Prevention and Control

Wendell O. Belfield, D.V.M.

DR. WENDELL O. BELFIELD is a graduate of Tuskegee Institute, School of Veterinary Medicine. He served in the Meat Inspection Division of the U.S. Department of Agriculture and as a captain in the U.S. Air Force. Dr. Belfield has published several papers on new and unorthodox therapies and surgical procedures. He has been in private practice for over 20 years and established the first Orthomolecular Veterinary Hospital in the United States. Dr. Belfield is the author of two books on vitamins and minerals for dogs and cats, *How To Have A Healthier Dog* (Doubleday), and *The Very Healthy Cat Book* (McGraw Hill).

Terminology

Orthomolecular by definition means "right molecule" and refers to a new branch of medicine developed by Dr. Linus Pauling. "Orthomolecular Medicine is the preservation of health and the treatment of disease by the provision of the optimum molecular constitution of the body, especially the optimum concentration of substances that are normally present in the body and are required for life."

INTRODUCTION

Leukemia may be defined as any malignant neoplastic proliferation of the leukocytes, their precursor, or allied cell types, when these neoplastic cells are found in the circulating blood. This disease is thought to occur in all warm blooded animals, but it is more frequent in the cat than in any other mammal commonly given veterinary care.

The causative agent, in recent years, was found to be a virus and the leukemias are classified according to the cells affected such as lymphocytic, lymphoblastic, monocytic, etc. Several cells of a series are occasionally present in essentially similar proportions, and in such cases, the leukemia is named according to the cell series, for example, myelogenous or lymphogenous. In man, studies have shown that a reasonable correlation can be made between the cell type, physical findings, and course of illness. Thus, the prefixes "chronic" and "acute" are used. Our limited experience with leukemia in animals does not permit us as yet to do this with any degree of reliability (Feline Medicine and Surgery, 1964).

FeLV Diseases

The FeLV virus can and will cause the following diseases:

1. Lymphosarcoma (LSA)
2. FeLV Non — regenerative Anemia
3. FeLV Panleukopenia-like syndrome
4. Myelogenous Leukemia
5. Thymic atrophy
6. FeLV Secondard Immunosuppressive Diseases

(Hardy, Wm. D., Jr., 1979.)

While all six of these diseases are extremely important, the two most often seen in my practice are the Thymic atrophy which affects the kittens of FeLV infected queens. The virus causes degeneration of the thymus resulting in a deficiency in the cell mediated immune response. FeLV Secondary Immunosuppressive Diseases in which the virus is an immunosuppressive agent and is indirectly responsible for several chronic secondary diseases (stomatitis, abscesses, upper respiratory infections). More cats die from these FeLV induced immunosuppresive disorders than die from LSA (Hardy, 1979).

This study was stimulated by a paper written by Dr. Francis M. Pottenger, Jr. M.D. of Monrovia, California (October 9, 1945). Dr. Pottenger performed feeding experiments with cats to determine the effect of heat-treated foods upon growth and development. This experiment stemmed from the fact that he suffered steady mortality among the cats on which adrenalectomies were performed for the purpose of standardizing adrenal cortical material. He found that feeding cooked meat scraps, together with raw milk and cod-liver oil were poor surgical risks, even though his technique was good. As his cat supply increased it was necessary to find a new source of meat. The new source came from a butcher and included muscle, bone and viscera. The raw meat was fed each day to the same group of cats. Within a very short time the cats in those pens survived the operations, the unoperated cats appeared to be in better health, and the kittens were born vigorous. The contrast in apparent health between the cats in the pens fed on raw meat scraps and those fed on the cooked meat scraps was so startling that he decided to do a feeding experiment. To summarize Dr. Pottenger's findings — those felines fed the raw meat diets were healthy and producing healthy normal progeny. Those females fed the cooked meats

were irritable and dangerous to handle. The males were more docile and unaggressive. Cats receiving the cooked meat scraps reproduced heterogeneous strain of kittens, each of the litter being different in skeletal pattern. Abortions in these queens were common, about 25 percent in the first generation and about 70 percent in the second generation. Queenings were generally difficult, many cats dying in labor. Mortality rates of the kittens were high and were often too frail to nurse. At times the queen would steadily decline in health following the birth of the kittens, dying from some obscure tissue exhaustion about three months after queening. Others experience increasing difficulty with subsequent pregnancies. Some failed to become pregnant. Osteomyelitis was common, cardiac lesions, hyperopia and myopia, thyroid disease, nephritis, hepatitis, orchitis, oophoritis, paralysis, meningitis, cystitis, arthritis and many other degenerative lesions. Vermin and intestinal parasites were abound. Skin lesions and allergies were frequent, being progressively worse from one generation to the next.

The cats receiving raw meat and raw milk reproduced in homogeneity from one generation to the next. Abortions were uncommon, litters averaged five and the mother cats nursed their young in a normal manner. The cats in these pens had good resistance to vermin, infections, and parasites. They possessed excellent equilibrium; they behaved in a predictable manner. Their organic development was complete and functioned normally.

Since this study was done in the late thirties, there was even less knowledge of feline diseases than now. It is reasonable to assume some of these cats may have had leukemia or related diseases. It was apparent to me, after reading Dr. Pottenger's paper that the raw meat contained substances that the cooked meats did not. It is generally known that most vitamins are destroyed during the cooking process.

The owners of cattery number one California Cattery enlisted my help to solve a serious leukemia problem in their cattery. Of the felines testing positive for FeLV, some females were not conceiving, some aborting, several adults dying and numerous kittens dying between the ages of 2-12 months. The situation was so bad at this cattery that the local veterinary school recommended the cattery be closed. Because of the work Dr. Pottenger had done thirty years earlier, I hypothesized the problem to be one of nutrition. There were six cats in this cattery that routinely tested positive to the IFA test. These six were divided into two groups, one with an oral multiple vitamin (RDA recommendations) and the other group with the same multiple vitamin plus 500 mg of sodium ascorbate (non-acid vitamin C). This cattery, biannually was tested for FeLV by a team of medical students as a clinical pathology exercise. Six months after the study began the three cats on the straight RDA multiple vitamins were still positive for FeLV. The three on the RDA multiple vitamins plus 500 mg of sodium ascorbate were negative. The multiple vitamin group in six months were still positive for FeLV.

The vitamin C group consisted of one male and two barren females, ages two and three respectively. Several months later both females were bred, both conceived. The two-year-old female had four healthy kittens all of which lived, the three-year-old female had three kittens all of which were alive as of the writing of this paper.

The non-vitamin C group were then placed on the vitamin C regimen and when tested six months later were all negative for FeLV. These three are now very active in the cattery's breeding program.

Cattery number two was newly formed three years ago. The breeding stock had been tested (IFA method) for FeLV. My first introduction to this cattery was testing a new adult female being introduced into the cattery for breeding purposes. Three blood smears (glass slides) were submitted to the laboratory for the IFA test — the test was positive for FeLV, and the animal was asymptomatic. Because of the positive IFA blood test, the feline was placed on an ascorbate regimen.. Ten weeks later, three more blood smears were resubmitted and the test was negative for FeLV. This negative result brought a phone call from the laboratory pathologist. "This animal was positive a month and a half ago and now it's negative, what are you doing?" There were five such cases in the past three years at this cattery. We are now in the third generation of offsprings and the entire cattery is negative for FeLV.

At no time were these FeLV carriers isolated from the other members of the catteries, who were already on the ascorbate regimen.. In fact, they were treated no differently than the others and permitted to socialize.

A third cattery in 1978 lost 90% of its kittens in a one-year period. Autopsies revealed no cause of the sudden infant death (SID). Each day the owner would find a kitten dead for no reason. One minute alive and apparently well, the next minute dead. These felines, like the other catteries previously mentioned were on a vitamin and mineral RDA. The queens all tested positive to the IFA leukemia test. To the RDA vitamin and mineral supplement we added 20-50 mg of sodium ascorbate to the 2-hour-old kittens and maintained this level daily, with oral dosages to weaning. Post-weaning, the vitamin C level was increased to 100-250 mg and maintained to adulthood. It was requested that the kittens be taken off the vitamin C to determine the effects.

however, the owners in the three catteries refused to cooperate for fear of losing any more animals.

Figure 1:

ORAL FELINE DOSAGES OF SODIUM ASCORBATE

KITTENS — PRE-WEANED (2 hours TO 5 wks.)	20mg.- 50mg.
KITTENS — POST-WEANED (5 wks. TO 6 mo.)	100mg-250mg.
ADULTS — MALES & FEMALES (6 months +)	500mg.-750mg.
PREGNANT QUEENS	750mg.-1.0g.

Discussion

It is apparent that the FeLV virus is immunosuppressive and raises havoc with felines, but we fell that before the entrance of the virus into the body there are other factors that permit the virus to gain a foothold in the animal. In other words, if the body defenses are up to the task, the virus would not be able to propagate and cause the problems these animals have been plagued with.

While corresponding with a Southern California organization dedicated to the eradication of feline leukemia, I was informed that, after extensive testing of FeLV animals, one of the puzzling findings was that all of the felines had high levels of lead. Upon further investigation we discovered that all felines tested for lead were being fed commercial cat foods. My inquiry to those catteries I had worked with revealed that the cats were being fed commercial cat food. An investigation of literature revealed a study by Fox, Aldrich and Boylen of M.I.T. (1976). This group did a study for lead content in 78 random samples of pet food purchased in local grocery outlets, and on 25 individual rations for laboratory animals. The lead content of 46 samples of cat food ranged from 0.1 to 7.6 micrograms per gram.

In man, as in other animals, lead exerts its toxic effect on a number of target organs, including the nervous system, the kidneys and the erythropoietic system. By inhibiting some enzyme systems, lead exerts widespread biologic effects. Some of these changes are subtle: lead has been shown to reduce the resistance of mice to bacterial infection and to reduce antibody formation and suppressed immune response to pseudorabies virus in rabbits (Fox, et al, 1976).

One interesting fact brought out by this study was that twenty-one of the tested cat foods contained more than 1.0 ppm of lead; of these, 10 had more the 2.0 ppm. If an adult, 4.5 kg cat consumed this food at a rate of 53 g/kg body weight/day, the amount of daily ingested lead would be 0.023-1.434 mg. This lead intake is 0.1-4.6 times the daily ingestion (0.3 mg/day) considered potentially toxic for children. Moreover, the feline burden of lead/kg body weight would be much higher than a child since a 2-3 year old child weighs considerably more than an adult cat (Fox, et al 1976).

Norsworthy of San Antonio (1977), made the observation that anemia is the most consistent finding of these leukemia diseases and the mechanism for its development are not completely understood. Most cases involve depression of the bone marrow. Sollmann, Torald (1948), in discussing chronic lead poisoning, indicates that there is degeneration and atrophy of the whole marrow tissue. The blood changes as a whole indicate increases destruction of the corpuscles. It is my opinion that the anemia associated with FeLV can be lead-induced, and is worthy of more investigation. Moreover, the entire predisposition of FeLV can very likely be charged to chronic lead poisioning since the M.I.T. report had brought out the possibility of reduced antibody production and suppressed immune response by the presence of lead.

Dr. Carl C. Pfeiffer's book on zinc and other micro-nutrients discusses the high concentrations of lead in pet food. He also discussed the positive effects of Vitamin C on heavy metals including lead. Dr. Pfeiffer (1978) wrote "under physiological conditions, vitamin C acts as a strong reducing agent to bring metal ions and affect their movement across biological membranes." Dr. Chattejee, et al, has reported on the dietary intake of metal ions and vitamin C metabolism. They have found that administration of any of the heavy metals — cadmium, lead or mercury — to rats, reduces the levels of vitamin C in both the liver and kidneys. Lead was administered in these experiments at a dose of 10 mg/100 g body weight raised vitamin C levels in tissues to above the control levels. Animal studies indicate that zinc and vitamin C may serve as antidotes for lead poisoning. In the *Journal of Laboratory and Clinical Medicine* (1939) vitamin C reversed lead poisoning in humans who had come in contact with lead filings.

Ascorbate Regimen

Ascorbic acid, in mega doses, is not recommended because of the 3.0 pH. This vitamin C will cause gastric upset, flatulence, acidosis and diarrhea. Also, due to the tartness most felines will not consume it when mixed with food. On the other hand, the ascorbates, (Fig. 2) are neutral (pH 7.4) and do not have the negative side effects of ascorbic acid.

Figure 2:

TYPES OF ASCORBATES (VITAMIN C)

ASCORBIC ACID — pH 3.0

SODIUM ASCORBATE
POTASSIUM ASCORBATE
CALCIUM ASCORBATE
MAGNESIUM ASCORBATE
ZINC ASCORBATE
MANGANESE ASCORBATE

→ pH 7.4

Affects of Ascorbate on immune components

The mechanism by which ascorbate may be involved in the control of infection is by way of the immune system. The leukocytes, in particular, contain high concentrations of ascorbate, 1.0 microgram per milligram of protein. Mononuclear phagocytes contain a higher concentration, 2.0 micrograms per milligram of protein with both peritoneal and alveolar macrophages being rich in ascorbate. It has been established the leukocyte ascorbate quality decreases following virus infection and after which returns to normal levels. Leukocytes absorb large amounts of ascorbate when they migrate into an area of infection. Ascorbate levels in leukocytes have shown to decrease in response to a variety of exogenous agents, many of which are associated with depressed immunological function. As was implied above, viral infection rapidly depletes leukocyte ascorbate (Thomas, W.R. and Holt, P.G., 1978).

Barton and Roath (1976) have surveyed leukocyte ascorbate levels in patients with a variety of abnormal leukocyte states and other hematological disorders. Levels below the normal range were found in most cases of chronic myeloid leukemia and chronic lymphatic leukemia, and in greater than 1/3 of patients with acute leukemias, lymphomas, glandular fever, myelofibrosis, polycythaemia, polymorphleukocytosis, purpura and those receiving cytotoxic drugs (Thomas and Holt, 1978).

Phagocytes

The direct involvement of ascorbate in neutrophil phagocytosis is probable since both ascorbate and dehydroascorbate are consumed in these cells during phagocytosis. Ascorbate appears to play a role in a number of neutrophil functions including increased chemotaxis, increased particulate ingestion, enhanced lysozyme meditated non-oxidative killing, protection against the toxic effects of superoxide anion radical, inhibition of the halideperoxide-myeloperoxidase system without a pronounced bactericidal effect and stimulation of the hexose monophosphate shunt (Leibovitz and Siegal, 1978). A more positive effect of exogenous ascorbate has been observed in neutrophils deficient in ascorbate. Steroid therapy depletes leukocyte ascorbate and also inhibits the phagocytic activity of human neutrophils, as judged by nitroblue tetrazolium reduction during phagocytosis of latex particles or by counting the accumulation of latex particles (Thomas, et al, 1978).

Interferon

Texas Reports on Biology and Medicine (1977) reported that in interferon, a protein produced by any nucleated cells of the body, seems to be the primary defense against viruses. Interferon production is stimulated only by the presence of viruses and is not observed when the body is not being challenged by a virus. There are two types of interferon which are linked to the chromasomes. One type attacks the virus intracellularly, surrounds it and prevents propagation. The other attacks the virus extracellularly and thought to destroy the virus by attacking the nucleic acid within the virus. In 1974, Siegal reported mice fed on an ascorbate supplemented diet displayed augmented levels of circulating interferon after stimulation with murine leukemia virus, and later (1975) demonstrated a similar phenomenon *in vetro* employing cultures of murine L cells and embryonic fibroblasts stimulated polynucleotides. Dahl and Degre (1976) had a similar finding to Siegel. Thomas and Holt (1978) observed that leukocyte interferon assayed in lung fibroblasts titrated 0.2-0.3 $\log_{10}$ units higher in the presence of 5.0 mg ascorbate than in the absence of the ascorbates.

Antibodies

The early literature on ascorbate and immunity suggests an important role for ascorbate in the humoral immune response. The addition of ascorbate to immunizing doses of antigen appeared to increase antibody production and deprivation apparently reduced the response.

At the time of this clinical study, the only test for leukemia was the IFA test. More recently the Antibody Titer Test (FeLV antibody test) is now available to aid the clinician in determining the degree of involvement of the leukemia virus. However, the standard test for FIP (Feline Infectious Peritonitis), a related viral disease, is determined by an antibody titer test. One patient was tested for FIP and had a titer of 1:400. This patient was placed on the vitamin C plus RDA vitamins and minerals and routinely retested one year later and the antibody titer was "0". The feline was retested in two days because we felt a discrepancy in the laboratory; the test once again read "0". I queried the laboratory pathologist and he informed me, "the test indicated the virus had been destroyed and, to have antibodies there must be a virus." This animal with no FIP antibodies has been exposed to other felines with FIP titers of 1:400 and developed no titer.

Antibody production is dependent on the presence of microorganisms in the body and do not appear for some six or seven days after infestation. It may be postulated that antibody production is the final line of defense for the body and antibodies may not be needed when the primary immunological defense (interferon, leukocytes, etc.) is functioning at maximum capacity.

Conclusion

In veterinary research there are no reports on the effects of exogenous ascorbate on the immune system of felines. Research is lacking because the members of our profession feel the 40 mg per kilo of

body weight (of ascorbate) produced daily in felines is adequate for all the animals' needs. This clinical study clearly shows that FeLV can be prevented and controlled with small amounts of exogenous ascorbate plus other vitamins and minerals daily in the diet. The plus in this study is the possibility of the virus being killed. In 1975, Dr. Fukumi Morishige in a paper published in Tokyo, Japan, stated that "the target attacked by 'C' is nucleic acid, and the scissions of nucleic acid strands are mainly responsible for the inactivation of the virus." Many of the now negative felines discussed in this paper for FeLV have been exposed to know FeLV carriers and they still remain free of the virus according to the test. It becomes obvious that antibody production is not necessarily the ultimate in the prevention of a virus but rather maintaining the primary immune components at maximum functioning levels with ascorbate. Antibody production appears to occur only when the ascorbate level in the primary defense components are at low levels thereby permitting some viruses to survive the primary defenses. Lead and the FeLV virus are both immunosuppressive agents adversely affecting the body defenses. Subramanian (1973), discussed the Suboptimal Compensatory Feedback. This feedback system increases the liver production of ascorbate with increased stress. This no longer occurs in felines. I would speculate this is a result of domestication. Dr. I.B. Chattejee, a renown biochemist of Calcutta, India, in a personal correspondence, informed me that his work with goats indicated that as these animals age the vitamin C production, in the liver, decreases. He further stated the reduction can be as low as ¼ of what is normally produced. Dr. Chattejee theorized that the same could be true of felines and canines. A feline producing at maximum, 40 mg per kilo of body weight of vitamin C daily (Fig. 3). This means that a 4.5 kilogram feline produces a maximum of 88 mg of vitamin C and an older feline may produce as little as 22 mg of C daily. With the intake of lead daily, considerable amounts of vitamin C will be destroyed or removed from the body. This 88 mg or less cannot carry the total burden of stress placed upon it by chronic lead poisoning and the FeLV virus. This amount of C cannot stimulate immune function to prevent FeLV; it cannot stimulate adquate cortisone to counteract stress; it is not adequate for good collagen production; and is not adequate to detoxify the impurities incorporated in commercial cat foods. It is the opinion of the author that the addition of vitamin C as previously discussed, to the RDA of vitamins and minerals stimulates the primary immune components to totally eliminate the FeLV virus from the body of felines.

Figure 3:

DAILY PRODUCTION OF ASCORBATE IN ANIMALS

ANIMAL	Ascorbate Production Milligrams/Kg Body Wgt/per day
Snake	10
Tortoise	7
Mouse	275
Rabbit	226
Goat	190
Rat	150
Dog	40
Cat	40
Monkeys, Apes, Man	0

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April 24, 1989

Dr. Wendell Belfield
3091 Monterey Rd.
San Jose, CA 95111

Dear Dr. Belfield:

I have read Mr. Larry Mueller's article on your work with preventing hip dysplasia with vitamin C. It was in the section Hunting Dogs in Outdoor Life. I was first very skeptical when reading the article, but as I finished it I came to the realization that none of us "experts" at Universities across this country or throughout the world can put a finger on the cause of hip dysplasia. There is one camp that argues genetic and another camp that argues nutritional but really no one has been able to prove the cause. Therefore, I came to the realization that you could be as right as anyone.

Therefore, If you would be so kind as to send me whatever literature or material you have on your theories. I would be most interested in reading them and also interested in applying for funding to test your hypothesis out.

Thank you in advance.

Sincerely,

T.D. Braden, DVM, MS
Professor and Head of Orthopedics

/ajt

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Chronic subclinical scurvy and canine hip dysplasia

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In large breeds of dogs, hip dysplasia, long considered an inherited birth defect, may be an easily controlled biochemical condition. The lesion in hip dysplasia appears to be merely poor-quality, low-strength collagen in the affected ligaments, caused by too little ascorbate for proper synthesis and maintenance of collagen. In eight litters from dysplastic German Shepherd parents or parents that produced dysplastic offspring, there have been no signs of hip dysplasia when the bitches were given mega doses of ascorbate during pregnancy and the pups were kept on a similar regimen until they reached young adulthood.

FOR THE PAST 30 or more years, efforts have been made to eliminate canine hip dysplasia through pseudo-selective breeding. The first observer of this condition recommended sterilization of all pups in a dysplastic litter.[1] This approach tends toward extremism and could lead to the extinction of some breeds. However, most veterinarians and breeders sterilize only puppies having dysplasia, permitting those from the same litter who are free of the malady to be bred. Assuming the condition is heritable, this pseudo-selective breeding has perpetuated hip dysplasia over the years because of the carrier factor in littermates not showing the disease.

It was never my opinion that the solution to hip dysplasia was as simple as selective breeding since, to date, this has not eliminated the problem. During 25 years of exposure to hip dysplasia, I have never found a genetic pattern. I have seen dogs and bitches certified by the Orthopedic Foundation for Animals produce dysplastic pups and, conversely, dysplastic parents produce normal offspring.

In an age when the medical community demands controlled and double-blind studies to prove a new medical concept, it is inconceivable that veterinarians have accepted, at face value, an unproven theory—that hip dysplasia is a genetic birth defect. The veterinary profession has made great strides in recent years in terms of facilities, therapeutics, surgical procedures, and technology. Why have we not solved the problem of canine hip dysplasia?

To date, only two investigators have looked at canine hip dysplasia at the cell level.[2] This team reported the involvement of the pectineus muscle and its effect on the coxofemoral joint. With the aid of a reputable veterinary pathologist, they disclosed through histologic studies that the pectineus muscle in potentially dysplastic pups undergoes myopathy (atrophy).

To understand the hip dysplasia syndrome, it is important to understand the meaning of the word *stress*. According to Hans Selye, stress is the nonspecific response of the body to any demand made upon it. Stress cannot be avoided; no matter what an animal does or what happens to it, there arises a demand to provide the energy neces-

sary for performing the tasks required to maintain life and to resist or adapt to changing external influences. Even a sleeping animal is under some stress; its heart must continue to pump blood, the intestines must digest food, and the muscles must move the chest to permit respiration. Complete freedom from stress is death.[3] A low stress condition is caused by natural body functions.

During the long evolution of vertebrates, stress has been a constant companion of developing animals. Means for combatting stress were developed early. One of the main biochemical systems for neutralizing the adverse effects of stress, and one whose importance is currently not fully recognized, is the enzyme system for converting blood glucose to ascorbate (incorrectly called vitamin C). This system is now situated in the mammalian liver.

The major biochemical functions of ascorbate are as an antistressor and detoxicant, and as a necessary metabolite for maintaining biochemical homeostasis in the animal's body. Daily requirements of ascorbate for the survival of mammals when they first appeared, some 165 million years ago, were so high that a separate biochemical feedback mechanism was evolved to produce increasingly greater amounts of ascorbate as stress increased. Both synthesis of ascorbate by the liver and the feedback mechanism had such great survival value that they exist in most mammals today.

The average puppy encounters a series of stresses during the first year of life. The first major adjustment is to a new environment when the puppy is taken from the mother (environmental stress). The pup is taken to the veterinarian for examination and deworming (toxicologic stress), then immunizations (immunologic stress) and, later, conformation and obedience training (physical and mental stress). Possibly the most important stress is the growth stress. Pups of the larger breeds grow rapidly during the first year of life. Together with the teething process, this puts a great demand on their young bodies. All of these constitute high-stress situations.

As noted in Table 1,[4] the canine species produces 40 mg of ascorbate per kilogram of body weight per day. Note also that the dog and cat produce considerably less ascorbate than do other mammals except primates. For the potential size of the German Shepherd, Great Dane, St. Bernard, and other dogs of the large breeds, production of ascorbate is extremely low compared to almost five times as much produced by a goat approximately the same size.

TABLE 1—Daily Production of Ascorbate in Animals

Animal	Ascorbate Production (Mg/Kg body weight)
Snake	10
Tortoise	7
Mouse	275
Rabbit	226
Goat	190
Rat	150
Dog	40
Cat	40
Primates (including man)	0

High-stress situations place a great demand on the animal for ascorbate, thereby requiring greater production of this substance in the liver. Some dogs appear to be relatively poor producers of ascorbate. This inability to produce large amounts of ascorbate may be due to either a failure of the stress-induced feedback mechanism[5] or to a sluggish liver enzyme system that does not respond with adequately increased synthesis of ascorbate. Inbreeding could be the basic cause of the enzyme system's partial failure to respond in the normal mammalian fashion.

Production of high levels of ascorbate during high-stress situations is necessary for maintaining homeostasis. When homeostasis is not maintained, the body or some of its organs and/or parts are noticeably weakened. One known biochemical result of insufficient ascorbate synthesis is the production of poor-quality, low-strength collagen.

Collagen is the principal solid substance in white fibrous connective tissue. It is this "intracellular cement" that connects tissues, giving them strength. The amino acid, proline, must be hydroxylated to form hydroxyproline. The latter substance forms polypeptide chains of tropocollagen, thus creating collagen. Hydroxylation of proline to hydroxyproline requires ascorbate.[6] Adequate ascorbate is also needed for the synthesis of high-quality collagen,[7] which must be maintained by large amounts of ascorbate to assure proper strength and functioning of tendons and ligaments.

In A TREATISE ON SCURVY, published in 1753, there are the following autopsy findings regarding joints of scorbutic cadavers at St. Lewis Hospital in Paris, in 1699...

> *The ligaments of the joints were corroded and loose. Instead of finding in the cavities of the joints the usual sweet oily mucilage, there was only a greenish liquor; which, by its caustic quality, had corroded the ligaments.*[8]

Thus, as far back as 1699 it was known that scurvy adversely affects the ligaments and joints. Admittedly, the autopsy findings reported above resulted from true clinical scurvy that caused death.

Dog-sled teams under a heavy work load on an expedition to the South Pole displayed signs of frank clinical scurvy. The signs diminished only when the dogs were fed the ascorbate-containing fresh liver from seals.[9] Dog-sled teams in the Midwest have also displayed clinical scurvy when subjected to high-stress conditions.

Though the pre-dysplastic pup may not display signs of frank clinical scurvy, its condition is related to the syndrome in man, called *chronic subclinical scurvy*.[10] Several diseases of dogs and cats have been linked directly to this syndome.[4]

In potentially dysplastic pups of large breeds, the first year or two of life is a high-stress period. The demands on the body are great, the demands for large quantities of ascorbate even greater. The ensuing lack of high-strength collagen in the coxofemoral ligaments, and the pectineal ligaments and muscles is obvious. The weak collagen in the ligaments causes them to stretch or loosen, resulting in joint laxity, which allows the young femoral head to separate from the acetabulum.

After separation of the femoral head from the acetabulum, an inflammatory process (arthritis) ensues. Varying amounts of scar-tissue form in the acetabulum, preventing the head of the femur from returning to its normal position. This results in coxofemoral subluxation (hip dysplasia). Simultaneously, the poor quality of collagen in the pectineous muscles and ligaments retards their growth and development (myopathy or atrophy).

The impaired growth and development of tendon and muscle, together with the rapid growth of the femur, contributes further to the etiology of the subluxation. This is because of the attachments of the pectineous muscle to the iliopectineal eminence and medial branch of the linea apera above the distal end of the femur.

An Effective Preventive Regimen

For the past five years, eight litters of German Shepherd puppies from dysplastic parents, or parents known to have produced dysplastic offspring, have been maintained on mega doses of ascorbate. To date, not one of these pups has shown dysplasia.

The regimen consists of giving the pregnant bitch 2 to 4 gm of sodium ascorbate crystals* in the ration daily. At birth the pups are given 50 to 100 mg of Ce-Visol® (Mead-Johnson) *per orum*. When the pups reach 3 weeks of age, the Ce-Visol is discontinued and sodium ascorbate, at a dosage of 500 mg daily, is given until the pups are 4 months old. At that time the dosage is increased to 1 or 2 gm daily and maintained at that level until the pups are 18 months to 2 years of age.

This program has been so successful that, when selling puppies, the breeders involved now incorporate into their sales agreements a clause stating that the pups are guaranteed dysplasia-free only if they are kept on the prescribed regimen of ascorbate.

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*If fine crystalline sodium ascorbate is not available from local sources, it can be obtained by mail from Orthomolecular Specialties, 3091 Monterey Hiway, San Jose, Calif. 95111. A new and improved sodium ascorbate preparation, Mega-C Plus, has been found to be the preferred supplement for this purpose.